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June 28, 2019

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington DC 20554

Re: ET Docket No. 18-295, GN Docket No. 17-183; *Unlicensed Use of the 6 GHz Band*; *Ex Parte* Communication

Dear Ms. Dortch:

On behalf of the Fixed Wireless Communications Coalition (FWCC), pursuant to Section 1.1206(b)(2) of the Commission's rules, please accept this notice of oral *ex parte* communications in the above-referenced dockets.

On Wednesday, June 26, 2019, the three undersigned of this firm, counsel for the FWCC, met Will Adams, Legal Advisor to Commissioner Carr. In addition, Mitchell Lazarus and Seth Williams met with Aaron Goldberger, Legal Advisor to Chairman Pai, and, separately, Erin McGrath, Legal Advisor to Commissioner O'Rielly.

We discussed several key concerns Fixed Service users have regarding the ongoing 6 GHz band proceeding, as summarized in the attached handout.

Please contact the undersigned with any questions.

Respectfully submitted,

Donald J. Evans
Mitchell Lazarus
Seth L. Williams
Counsel for the Fixed Wireless
Communications Coalition

Cc: Aaron Goldberger
Erin McGrath
Will Adams

Unlicensed Use of the 6 GHz Band

ET Docket No. 18-295
GN Docket No. 17-183

Deploying 6 GHz RLANs While Protecting the Fixed Service

Fixed Wireless Communications Coalition

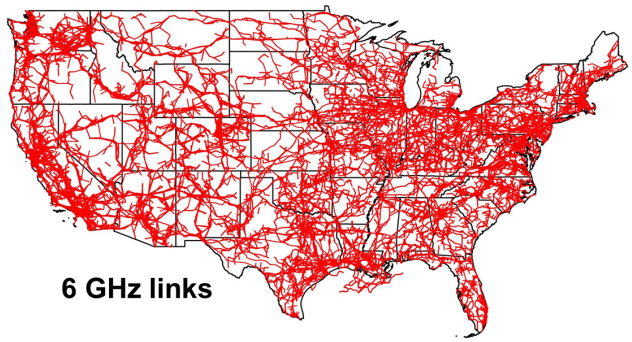
June 26, 2019

About the FWCC

- Companies, associations, individuals interested in terrestrial fixed microwave
  - membership includes manufacturers, designers, coordinators, installers, providers, end users.
- Formed in 1998, speaks for the fixed service community
- Active in 70+ FCC matters plus NTIA, FAA, GAO, courts.

About 6 GHz Fixed Service Microwave

- 97,000 U.S. links
- Safety-critical services, including:
  - synchronizing railroad trains
  - controlling petroleum and natural gas pipelines
  - balancing the electric grid
  - dispatching public safety and emergency vehicles
  - plus business and market data
- Many public safety users, utilities, others filed comments urging full interference protection
- 6 GHz is the only fixed service band that can span tens of miles.



6 GHz links

Fixed Service Reliability

- Extremely high:
  - safety-related links: 99.9999% per link
    - 30 seconds outage per year
  - most others: 99.999% per link
    - 5 minutes outage per year
- Links typically operate uninterrupted for years
  - even rare RLAN-caused failures will eat up years' worth of outage allowance
- The FWCC's only goal in this proceeding is to keep reliability levels unchanged for all fixed links.

RLAN Proposal

- Deploy 958,062,017 unlicensed RLANs in the 6 GHz bands
- Protect the fixed service with Automatic Frequency Control (AFC), but exclude:
  - indoor RLANs at 30 dBm (1 watt)
  - outdoor RLANs at 14 dBm (25 milliwatts).

Faulty RLAN Argument #1

- RLAN proponents predict low risk of interference because RLANs probably
  1. are blocked by building walls
  2. are outside the fixed service main beam
  3. are too far away to cause interference
  4. won't use up all of the receiver's fade margin
  5. may just cause a slowdown, not a complete outage
  - Items 1-3 are demonstrably incorrect in large numbers of cases
- Argument predicts unlikely interference only from one RLAN in a typical location
- Hundreds of millions of RLANs give a very different result …

Fallacy: Near-Certain Interference from Non-AFC RLANs

- Fixed service interference is usually from one emitter in an unlikely location
  - (line-of-sight to the fixed service receiver)
- RLAN proponents project 958,062,017 devices
- If each RLAN at each moment has only a one-in-a-trillion chance of causing interference:
  - 958,062,017 RLANs would cause near-certain interference at every moment into 90+ fixed service links*
  - would be impermissible “harmful interference” by any standard.

* Calculations: FWCC at 21-23 (March 18, 2019)

Fallacy (cont'd)

- A recent RLAN filing still gets it wrong:
  - "All of these improbable situations are very unlikely to occur simultaneously, even when multiplying this small probability across every FS receiver in the United States."*
- Correct calculation: possible interference into 97,000 fixed service link receivers from every one of 958,062,017 RLANs
- Large numbers of non-controlled RLANs make interference mathematically almost certain
  - and when they cause interference, they cannot be turned off.

* Apple et. al, attachment at 19 (June 24, 2019) (emphasis added).

Faulty RLAN Argument #2

- RLAN interests' propagation models rely on typical terrain and clutter
  - valid for assessing statistics – e.g., cell coverage
  - invalid for assessing effects of an individual RLAN
- These models miss the lone interfering emitter in an unlikely location
  - cause of most real-world interference
  - RLAN proponents dismiss them as "corner cases"
- **It is reckless to assume terrain and clutter on every path because it is there on a typical path**
  - the AFC must assume free-space propagation unless terrain and clutter are known
  - (this one factor accounts for most differences between RLAN and FS interference predictions.)

Faulty RLAN Argument #3

- RLAN proponents say fixed receiver link margin will absorb interfering signals
- Fixed users pay for link margin as capital investment to achieve high reliability
  - designers provide minimum margin for needed reliability
  - any RLAN interference reduces reliability
- AFC must not rely on link margin
  - not public property available to RLAN providers.

The Law Requires Fixed Service Protection

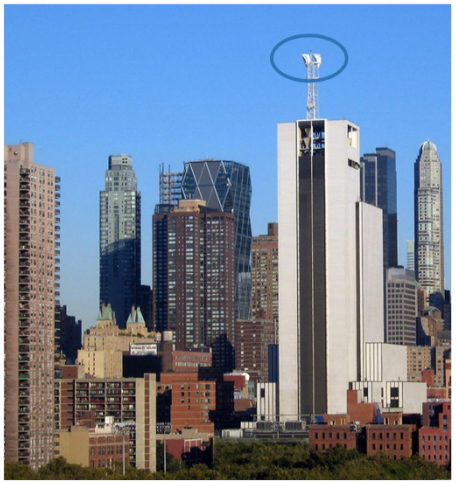
- D.C. Circuit: the FCC can lawfully authorize unlicensed devices only where it has determined they do not present a significant potential for causing harmful interference to licensed services*
- The unrebutted record shows that hundreds of millions of RLANs will cause harmful interference, without universal and adequate AFC control†
- To allow inadequately controlled RLANs would violate the Communications Act.

* *ARRL v. FCC*, 524 F.3d 227, 234-35 (D.C. Cir. 2008) (construing Section 301 of Communications Act)

† *E.g.*, Nokia (Bell Labs) at 4-5 (Feb. 5, 2019); Comsearch at 8-15 (Feb. 15, 2019); FWCC at 23-26, 29-31 (March 18, 2019); others

One Last Point …

- Technical details of the AFC are in dispute:
  - interference criterion, guard bands, fade margin incursion, default propagation, database, frequency of updates, vertical RLAN location, client probe signals, reporting interference, phased rollout, point-to-point and point-to-multipoint RLANs, moving vehicles
- The fixed service industry asks only for measures that are verifiably necessary to maintain its reliability.



Conclusion

- Proper AFC design, with all RLANs under AFC control, will allow RLAN service while protecting fixed microwave
- We concede full AFC control may reduce RLAN spectrum at some locations
  - protecting licensed users is the cost of unlicensed access to the spectrum.

Thank you!

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